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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,917	08/16/2000	Joseph M. Brand	108298530US	4048

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EXAMINER

MITCHELL, JAMES M

ART UNIT PAPER NUMBER

2827

DATE MAILED: 02/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/639,917	Applicant(s) BRAND, JOSEPH M.	
	Examiner James M. Mitchell	Art Unit 2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 32-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 32-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-16 and 32-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Use of the word "approximately" by applicant results an indefinite claim as if applicant had used the word about, since the two words are synonymous and "about" has been held indefinite, as in this case, when applicant has not provided any indication as to what **range** is covered by the word about. *Amgen, Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991); see *Jack Winter, Inc. v. Koratron Co.*, 375 F. Supp. 1, 181 USPQ 353 (DCNCalif).
3. Furthermore claims 1-16 and 32-36 recites the limitation "the thickness" in claims 1, 10 and 32. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 2, 4-7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kojima et al. (US 5,723,900).

6. Kojima (Fig 4G-J, 8) discloses a method for packaging a microelectronic substrate (13) comprising disposing an encapsulating material (14; Col. 4, Lines 56-58) in direct contact with a surface of the microelectronic substrate and exposing at least a portion of the surface of the microelectronic substrate memory chip (Col. 6, Line 10) by removing a portion of the encapsulating material (Fig 4I) in direct contact with the surface of the microelectronic substrate with the microelectronic in an inherent operable condition (removal performed on inactive surface) after the portion of the encapsulating material is removed; wherein the substrate has a first surface and a second surface facing opposite the first surface, the first surface having a plurality of bond sites (17) for electrical connection to the microelectronic substrate; further transferring heat by transmitting it directly away from the exposed portion of the surface of the microelectronic substrate and therefore by convection; mounting the microelectronic substrate to a printed circuit board (29; Col. 5, Line 62); further the encapsulant is adjacent both the substrate and the board or support member; with the thickness of the microelectronic substrate very similar and therefore at least approximately to the thickness of the substrate before and after a portion of encapsulant is exposed .

7. Claims 10 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishimura (JP 361114563).

8. Nishimura (Fig 1, 2) discloses a method for packaging a microelectronic substrate (21), inherently disposing encapsulating material (3) adjacent and in direct contact with the substrate and support member, and forming a heat transfer structure in

an external surface of the encapsulating material by manipulating at least a portion of the encapsulating material in direct contact with substrate to define at least one exposed (via perimeter of cylinder) heat transfer surface of the heat transfer structure wherein forming a heat transfer structure includes forming cylindrical, rib, rod of encapsulating material projecting away from the substrate; with a thickness of the microelectronic substrate remaining at least approximately the same before and after the portion of the encapsulating material is manipulated; and mounting the substrate to a support member (2 & lead plate; not labeled) and electrically coupling the substrate to support member (wires not labeled).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3, 7, 8, 10-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima in combination with Yasunuga (US 6,544,814).

11. Kojima discloses the elements stated in paragraph 4 and heat transfer structure with ribs projecting away (32).

12. Kojima does not appear to disclose manipulating or removing the encapsulant material by directing laser radiation at about 4 to 25 watts that inherently sequentially removes portion of the encapsulating material (layer after layer is removed).

13. However, Yasanuga utilizes exposing laser radiation having an inherent power to an encapsulant.

14. It would have been obvious to one of ordinary skill in the art to form the package of Kojima by directing laser radiation as an alternate method to remove an encapsulant as taught by Yasanuga (Col. 1, lines 29-30).

15. With respect to the laser beam having a power from 4 to 25 watts, the modified prior art discloses a laser beam having an inherent watt, but not explicitly between 4 to 25 watt. However, it would have been obvious to one ordinary skill in the art to have a laser at 4 to 25 watts, since it has been held that discovering optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980).

16. Claims 32-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kojima and Yasanuga in combination with Hong (US 6,297,543).

17. Kojima discloses the elements stated in paragraph 4 and further discloses an aperture (not labeled).

18. Kojima does not appear to disclose manipulating or removing the encapsulant material by directing or engaging laser radiation or beam at about 4 to 25 watts that sequentially removes portion of the encapsulating material (layer after layer is removed), removing an encapsulating material having a thickness greater than about .003 inch or passing wire bonds through an aperture.

Art Unit: 2827

16. However, Yasanuga utilizes exposing or engaging laser radiation having an inherent power to an encapsulant, such that an encapsulant having an inherent thickness is removed.

19. It would have been obvious to one of ordinary skill in the art to form the package of Kojima by directing laser radiation as an equivalent method to remove an encapsulant that has an inherent thickness as taught by Yasanuga (Col. 1, lines 29-30).

20. Hong teaches passing wire bonds through an aperture (Fig 7).

21. It would have been obvious to one of ordinary skill in the art to pass a wire bond through the aperture of Kojima as an alternate means to provide connection as taught by Hong (Abstract).

22. With respect to the laser beam having a power from 4 to 25 watts, the modified prior art discloses a laser having a watt, but not between 4 to 25 watt. See paragraph 15 of this office action.

23. With respect to the thickness of the encapsulant being removed, absent evidence of criticality, it would have been obvious for the portion removed to be .003 inch, because it has been held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984).

24. Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Nishimura (JP 361114563) as applied to claim 10 and further in combination with Yoneda (JP406177268).

25. Nishimura does not appear to disclose removing portion of the encapsulating material from a region proximate to the microelectronic substrate.

26. Yoneda utilizes removing a plastic resin (Abstract) in order to provide a pattern of cylindrical protrusions as required by Nishimura (Abstract).

27. Claims 1-3, 5-9, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joiner, Jr. (US 5,483,098) in combination with Yoneda (JP 406177268).

28. Joiner, Jr. (Fig 3-5) discloses a method for packaging a microelectronic substrate, comprising disposing an encapsulating material (22) in direct contact with a surface of the microelectronic substrate (13); wherein the microelectronic substrate has a first surface and a second surface facing opposite the first surface, the first surface having a plurality of bond sites (not labeled) for electrical connections (via 20) to the microelectronic substrate, and exposing a portion of a surface of the microelectronic substrate includes exposing a portion of the second surface (14) of the microelectronic substrate; and mounting the microelectronic substrate to a support member (38) with a first surface of the microelectronic substrate facing the support member (Fig 4) and a second surface of the microelectronic substrate facing away from the support member, and electrically coupling the microelectronic substrate to the support member by

Art Unit: 2827

passing wires (42) through an aperture in the support member and connecting one end of each wire to the support member and microelectronic substrate, disposing the encapsulating material adjacent to both the microelectronic substrate and the support member, and exposing at least a portion of the second surface of the microelectronic substrate; further transferring heat (28) directly away from the exposed portion of the surface of the substrate; and inherently forming a heat transfer feature in the encapsulating material by removing portions of the encapsulating material to define exposed external surface of the heat transfer feature.

29. Joiner does not appear to show exposing at least a portion of the surface of the microelectronic substrate by removing a portion of the encapsulating material by directing laser radiation toward the portion of the encapsulating material in direct contact with the surface of the microelectronic substrate with the thickness of the microelectronic substrate remaining at least approximately the same before and after the portion of the surface is exposed and with the microelectronic substrate in an operable condition after the portion of the encapsulating material is removed, or wherein removing portion of the encapsulating material includes sequentially removing layers of the portion of the encapsulating material by sequentially exposing the layers of encapsulating material to laser radiation, or forming a heat transfer feature in the encapsulating material by removing portions of the encapsulating material to define exposed external surface of the heat transfer feature.

30. Yoneda utilizes exposing at least a portion of the surface of an embedded surface or microelectronic substrate (via semiconductor formed on substrate) by

removing a portion of the encapsulating material by laser in direct contact with the surface of the microelectronic substrate with the thickness of the microelectronic substrate remaining at least approximately the same before and after the portion of the surface is exposed and with the microelectronic substrate in an operable condition (via patents presumed valid) after the portion of the encapsulating material is removed , wherein removing portion of the encapsulating material inherently includes sequentially removing layers (material comprises multiple contiguous layers) of the portion of the encapsulating material by sequentially exposing the layers of encapsulating material to laser radiation, that inherently forms a heat transfer feature in the encapsulating material by removing portions of the encapsulating material to define exposed external surface of the heat transfer feature (via perimeter of encapsulant).

31. It would have been obvious to one of ordinary skill in the art to incorporate removing a portion of the encapsulating material in direct contact with the surface of the microelectronic substrate of Joiner, such that microelectronic substrate remains at least approximately the same before and after the portion of the surface is exposed and with the microelectronic substrate in order to provide a functionally equivalent exposed surface structure to attach heat sink as required by Joiner (Abstract).

32. With respect to claims 8 and 34, see paragraph 15 of this office action.

33. With respect to claim 36, see paragraph 23 of this office action.

34. Claim 4 rejected under 35 U.S.C. 103(a) as being unpatentable over Joiner. Jr. (US 5,483,098) and Yoneda (JP 406177268) as applied to claim 1 and further in combination with Kojima (US 5,723,900).

35. Joiner and Yoneda appear to further show the package mounted to a board (Joiner Abstract), but does not show a memory chip.

36. Kojima teaches a memory chip (Col. 6, Line 10).

37. It would have been obvious to one of ordinary skill in the art to incorporate a memory chip in the structure of Joiner in order to provide a chip as required by Joiner.

Response to Arguments

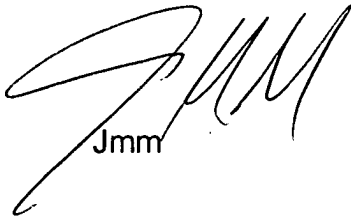
38. Applicant's arguments with respect to claim have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

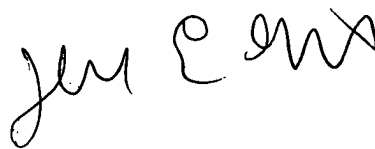
39. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on (571) 272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jmm



**DAVID E. GRAYBILL
PRIMARY EXAMINER**